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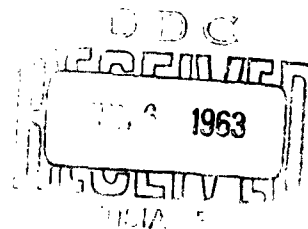
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TO:



Leadership and Organizational Behavior
Test of a Proposed Theory
G. J. Palmer, Jr., Ph. D.
Principal Investigator
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Group Psychology Branch
Psychological Sciences Division
Office of Naval Research

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INFORMATION PROCESSES IN INTERPERSONAL RELATIONSHIPS

George J. Palmer, Jr.

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ABSTRACT

In trial studies of interpersonal relationships associated with interpersonal knowledge, real similarity, and the psychological structure of groups, each member of a group completed multiple-choice, objective questionnaires (X_{ij}) according to his best knowledge of each other member, and for himself in self-description (X_{ii}). Analysis of interpersonal knowledge ($k_{ij} = X_{ij}X_{jj}$) and similarity ($s_{ij} = X_{ii}X_{jj}$), which were obtained for 36 3-7-man, student teams in management gaming competition and for three, 8-patient, psychotherapeutic groups in a mental hospital, resulted in these conclusions. Interpersonal relationships identified in information and interpersonal learning are measurable processes of acquisition and relative interpersonal discrimination, which vary positively with duration of interaction and similarity, negatively with size of group, and differentially with class of information.

INFORMATION PROCESSES IN INTERPERSONAL RELATIONSHIPS¹

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The present study is part of a research project which is concerned with the possibilities of testing hypotheses about group processes associated with interpersonal knowledge (the possession of interpersonal, objective information and its acquisition); real similarity among members of a group; and the psychological structure of groups as revealed in the patterns of interpersonal score matrices for various classes of information areas. The objective of this work is to attempt development of lawful relationships and specification of conditions under which relationships hold, as well as to consider some attendant methodological issues (Palmer 1960a, 1961).

The objective of this paper is to outline some background methodology and preliminary findings from use of an objective information approach to the study of interpersonal relationships, and to indicate present directions in research.

PROCEDURE

Suppose that each member i of a group is tested for his knowledge of each other member j and that each member answers the same test in self description. The response patterns of i in answering about j is symbolized X_{ij} . The responses of i and j in self description are X_{ii} and X_{jj} , respectively.

Tests

Items in tests being used are objective, multiple-choice, one-answer-only questions, verifiable in subject matter, as illustrated by the following specimens.

Religion?

- (1) Catholic
- (2) Jewish
- (3) Methodist
- (4) Episcopalian
- (5) Baptist
- (6) None of these

Ever had these ailments?

- (1) Chicken pox
- (2) Broken arm
- (3) Both 1 and 2
- (4) Neither 1 nor 2

When in high school or college, had these (part-time or full-time jobs?

- (1) Made deliveries, as on bicycle, foot, or by other means (as newspaper delivery boy, mailman, milk routeman)
- (2) Worked as sales clerk in department, grocery, or drug store
- (3) Both 1 and 2
- (4) Neither 1 nor 2

Usually take coffee as follows?

- (1) Black without cream or sugar
- (2) With cream and sugar
- (3) With cream only
- (4) Black with sugar only
- (5) None of these; never take coffee; or have no regular preference of coffee combination.

Interpersonal knowledge

Interpersonal knowledge, $k_{ij} = X_{ij}X_{jj}$, is a comparison, made by overlapping stencils, of i 's report on j with j 's self report. These k_{ij} scores, presented in a double-entry table (Table 1), indicate in the row totals (K_i) the amount that person i knows about others, and indicate in the column totals (N_j) the amount that person i is known by others.

Similarity

Furthermore, the real similarity of i and j , defined for the same information area, is $s_{ij} = X_{ii} X_{jj}$.

Samples

These measures have been obtained through repeated measures with 20-item, alternate forms on 36 groups, 3 to 7 students each, engaged in management gaming in courses in business administration, and on 24 subjects (three 8-man groups), mental hospital patients undergoing psychotherapy and institutional care. Thirty-six student groups were tested at least once, some groups twice, and 10 groups four times so as to span the semester. (Because of the differences between conditions (e.g., frequency of meetings) for student and patient groups, data for patients have been considered only informally and are not included in the presented results.) Data for all groups of students could not be collected over the whole semester, because of class schedules. Hence, not all interactions could be examined in detail, though overall statistical tests have been found significant for the following results.

RESULTS

1. In general, increasing amounts of interpersonal information are acquired as a function of the length of interaction (Figs. 1 and 2).

2. The average amount of interpersonal information per person, and the average rate of acquisition, are higher in small groups.

3. The average amount of interpersonal knowledge is substantially related to interpersonal similarity (to the extent of linear $r = .70$), although the explanation of how similarity enters into interpersonal knowledge (for example, through projection or stereotyping.), and further consideration of the definitional measurement of similarity, are additional tasks to be attempted (Fig. 3).

4. Along with rising average amounts of information acquired per person, one interesting finding is that interpersonal learning is markedly discriminative, revealed by r_{KN} , the correlation of row and column totals. As interaction progresses in time, those persons who, in general, know more about others become relatively less well known, and those who are better known tend to know relatively less about others (Fig. 4). This relationship, taken with that in Fig. 1, implies an increasing internal, relative differentiation of members, while at the same time, all members are generally getting to know each other better.

5. The trend is for this discrimination process to take place faster in smaller groups. For groups equal in size, the rate of discrimination, expressed in these indices, is more rapid than the rate of acquisition (Figs. 4 and 5).

6. The trend of correlations r_{KN} is from negative values for small groups of size 3 to approach and home on $r_{KN} = 0$ for

groups of 7 or more members (Fig. 5). It seems clear that, as group size increases to infinity, r_{KN} approaches 0 as a limit. Psychological structuring, which would not be evident in the totals of larger groups, would be expected in the form of psychological cliques, and presumably these could be identified by factoring down to subgroups.

The limit of discrimination around number 7 is interesting in relation to rules of thumb in management that supervision tends to deteriorate, or at least be noticeably more difficult, with more than 7 to supervise (the span of control principle). Similarly, the number 7 is said to be about the limit, plus or minus two, of the number of items of information that humans can ordinarily apprehend (Miller, 1956).

7. A further aspect of interpersonal processes for which we are making certain analyses is the diffusion of various kinds of information. While we have no systematic results to report, it is clear that, as one would certainly expect, some kinds of information are known or become known more rapidly.

(a) One kind of such information is that for which ready clues and knowledge of clues are widespread. For example, if a person's name is O'Kelly, this is a clue that he is probably of Irish descent and is probably Catholic. Likewise, the name Sternberg,

most often a Jewish name, is a clue to the religion insofar as the name - religion linkage is known.

(b) In other cases, certain kinds of information seem to have greater interest value, or other special properties that increase circulation. For example, it commonly becomes known if a member is a graduate of highly visible universities, such as Harvard or Princeton, but the fact that a member graduated from other places does not get so widely known. In some instances, some information stands out by contrast with characteristics of the rest of the group. In these cases information circulates apparently by reason of differential gossip value.

DISCUSSION

It will be one task to identify the kinds of predicates and group conditions involved in these information processes. One aspect of this work is the development and refinement of various subject matter tests representing a range of information areas and levels of "difficulty" (reflecting, for example, "intimacy" or "length of acquaintance") in interpersonal knowledge. Steps in this direction have been taken by development of guides and specification charts for development of tests (Palmer, 1960b), though further work remains to be done. At the same time, we are maintaining a repository file of data from various studies (our own and those of

other investigators who may voluntarily participate) so as to develop a broader base of evaluation and validation. It is to be hoped that such data can be brought together, with the cooperation of various investigators, without infringing their prior rights in the data, and analyzed in a consistent manner for the purpose of comparison and generalization from different studies in different settings.

Results to date have been obtained in limited populations, without extended control groups, although the use of alternate forms might be thought to reduce but not overcome the latter limitation. While recognizing such limitations, it seems reasonable to propose, for further cross validation and qualification, the hypothesis that interpersonal information processes involve simultaneous acquisition and discrimination, as conditioned by such variables as size, duration of interaction, similarity, and other group conditions.

SUMMARY AND CONCLUSIONS

In trial studies of interpersonal relationships associated with interpersonal knowledge, real similarity, and the psychological structure of groups, each member of a group completed multiple-choice, objective questionnaires (X_{ij}) according to his best knowledge of each other member, and for himself in self-description

(X_{ij}). Analysis of interpersonal knowledge ($k_{ij} = X_{ij}X_{jj}$) and similarity ($s_{ij} = X_{ii}X_{jj}$), which were obtained for 36 3-7-man, student teams in management gaming competition and for three, 8-patient, psychotherapeutic groups in a mental hospital, resulted in these conclusions. Interpersonal relationships identified in information and interpersonal learning are measurable processes of acquisition and relative interpersonal discrimination, which vary positively with duration of interaction and similarity, negatively with size of group, and differentially with class of information.

REFERENCES

- Miller, G. A. The magical number seven, plus or minus two: some limits on our capacity for processing information. Psychol. Rev., 1956, 30, 81-97.
- Palmer, G. J., Jr. A method for objective measurement of interpersonal relations and group behavior. Project NR 170-478, Contract Nonr 475(08), Technical Report 1, October 1960. Tulane University, New Orleans, Louisiana. (a)
- Palmer, G. J., Jr. Tests of interpersonal knowledge: Some development considerations and specifications for a universe of items. Project NR 170-478, Contract Nonr 475(08), Technical Report 2, November 1960. Tulane University, New Orleans, Louisiana. (b)
- Palmer, G. J., Jr. Test of a theory of leadership and organizational behavior with management gaming. Project NR 170-478, Contract Nonr 1575(05), Annual Report 2, November 1961. Louisiana State University, Baton Rouge, Louisiana.

FOOTNOTE

1. Presented at the Symposium on Interaction of Perception and Social Organization, 55th Annual Meeting of the Southern Society for Philosophy and Psychology, Miami Beach, Florida, April 12, 1963. This work was supported by Contract Nonr 4067(00), Project NR 170-478, between the Office of Naval Research (Group Psychology Branch) and Texas Christian University.

TABLE 1

Interpersonal Knowledge Scores

($i \neq j$)

| | | N | | | | | |
|------------------|---|----------|----------|-----------------------|----------|----------|-------|
| | | Person j | | | | | |
| K Person i | | 1 | 2 | 3 j c | | | |
| | 1 | | k_{12} | k_{13} | k_{1j} | k_{1c} | K_1 |
| | 2 | k_{21} | | k_{23} | k_{2j} | k_{2c} | K_2 |
| | 3 | k_{31} | k_{32} | | k_{3j} | k_{3c} | K_3 |
| | . | | | | | | |
| | . | | | | | | |
| | . | | | | | | |
| | i | k_{i1} | k_{i2} | k_{i3} | k_{ij} | k_{ic} | K_i |
| | . | | | | | | |
| | c | k_{c1} | k_{c2} | k_{c3} | k_{cj} | | K_c |
| | | N_1 | N_2 | N_3 | N_j | N_c | |

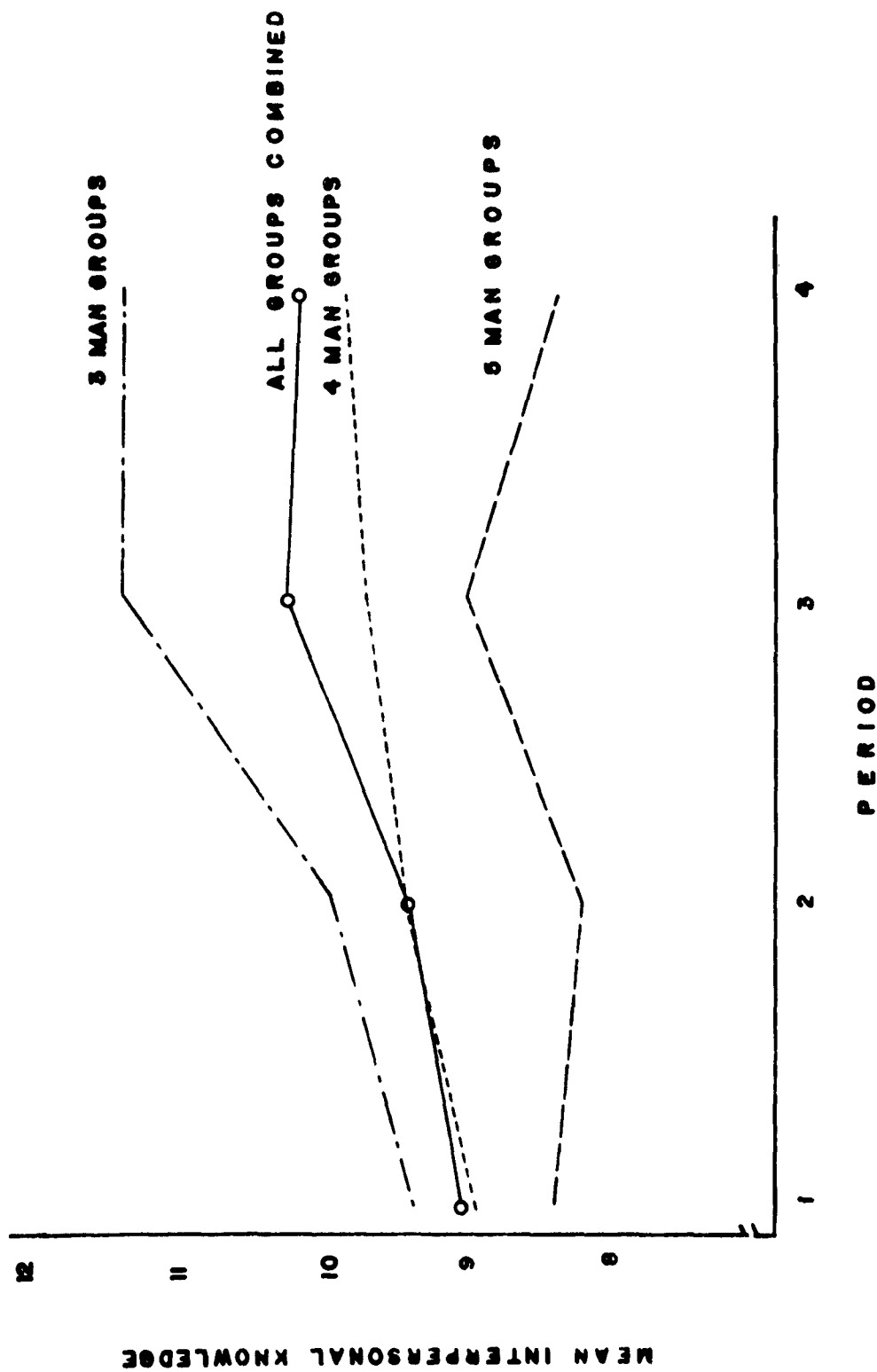


FIG. 1. MEAN INTERPERSONAL KNOWLEDGE AS A
FUNCTION OF TIME PERIOD FOR
GROUPS OF DIFFERENT SIZE.

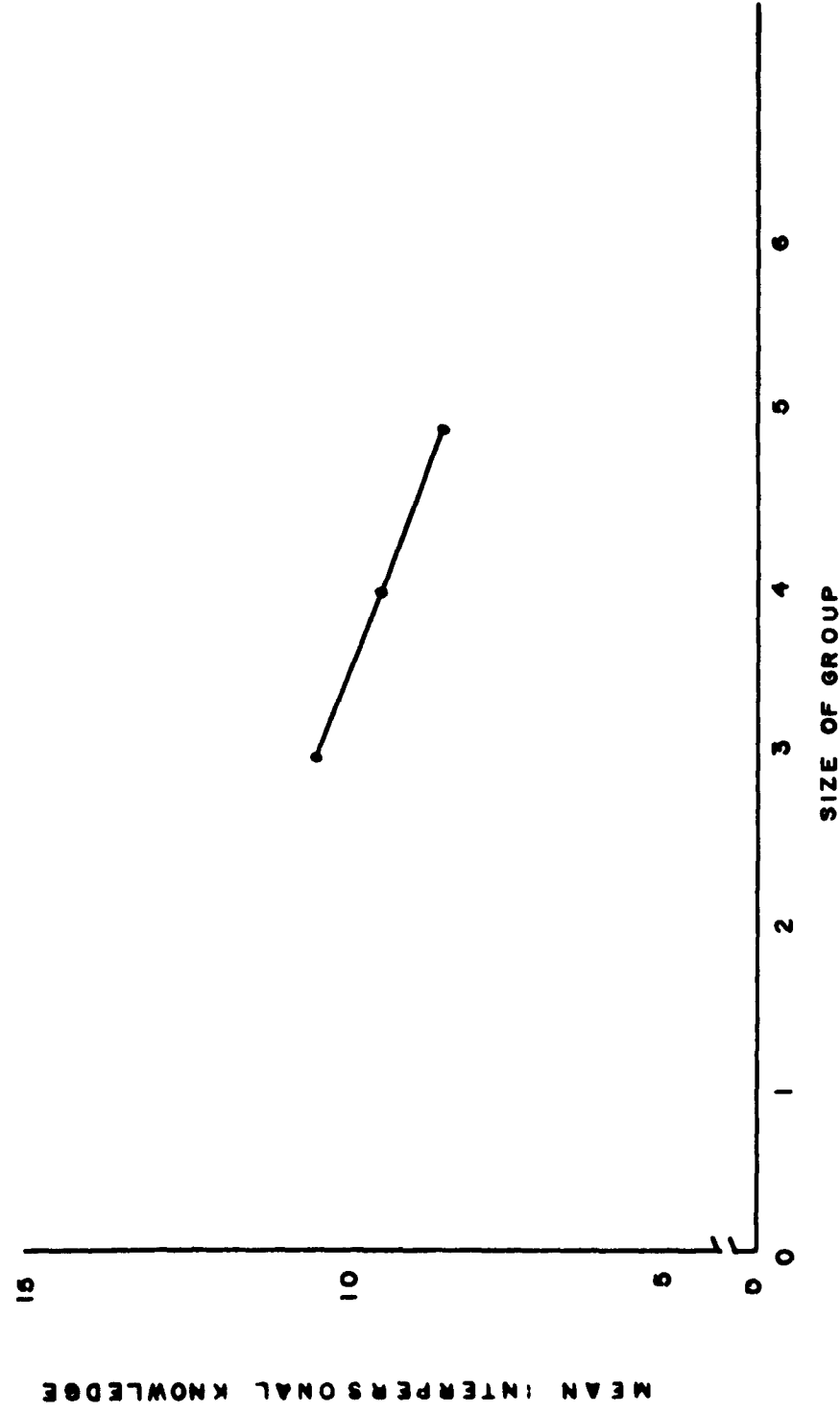


FIG. 2. INTERPERSONAL KNOWLEDGE AS A
FUNCTION OF SIZE OF GROUP.

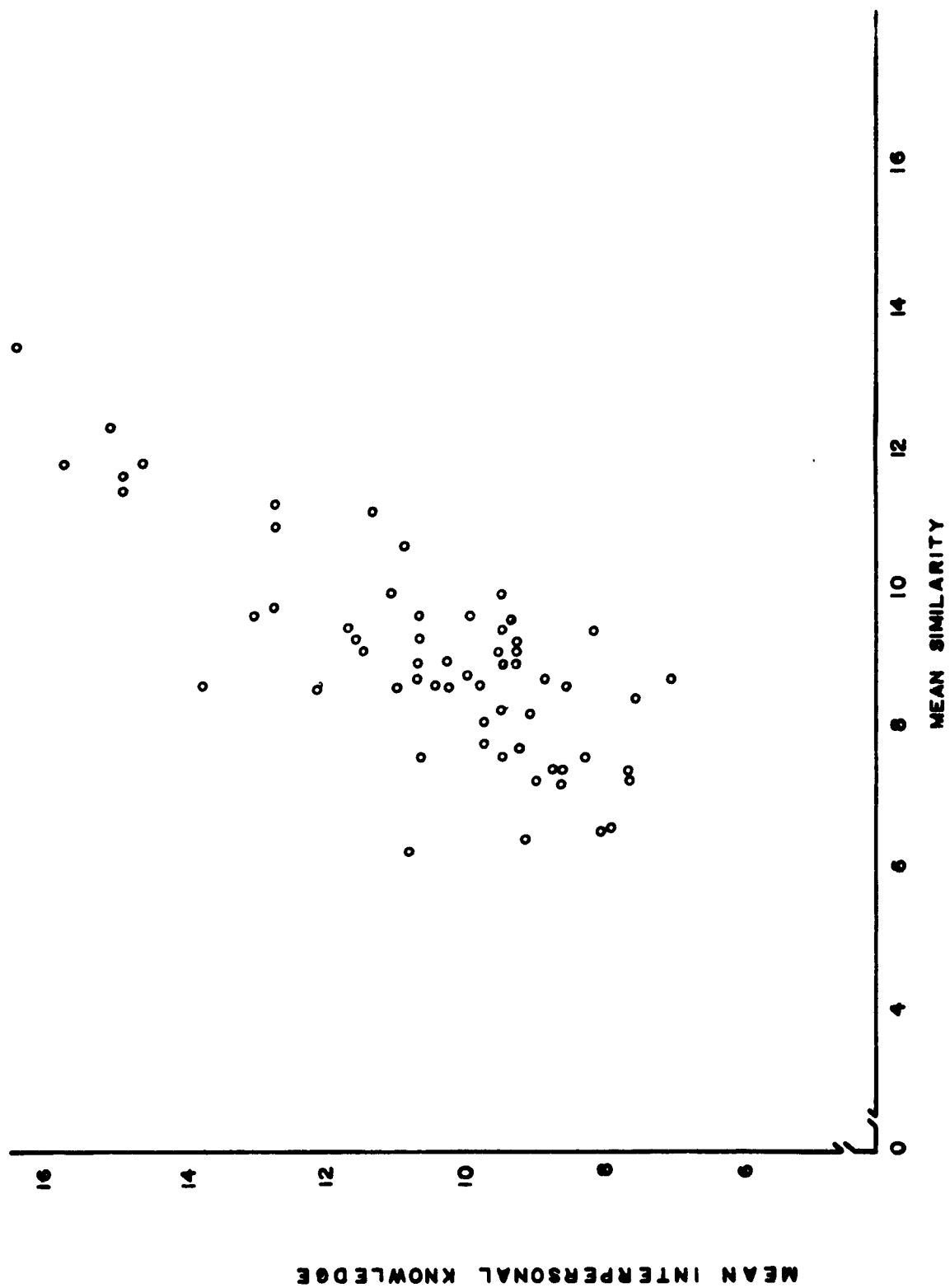


FIG. 3. RELATIONSHIP BETWEEN MEAN INTERPERSONAL KNOWLEDGE AND MEAN INTERPERSONAL SIMILARITY.

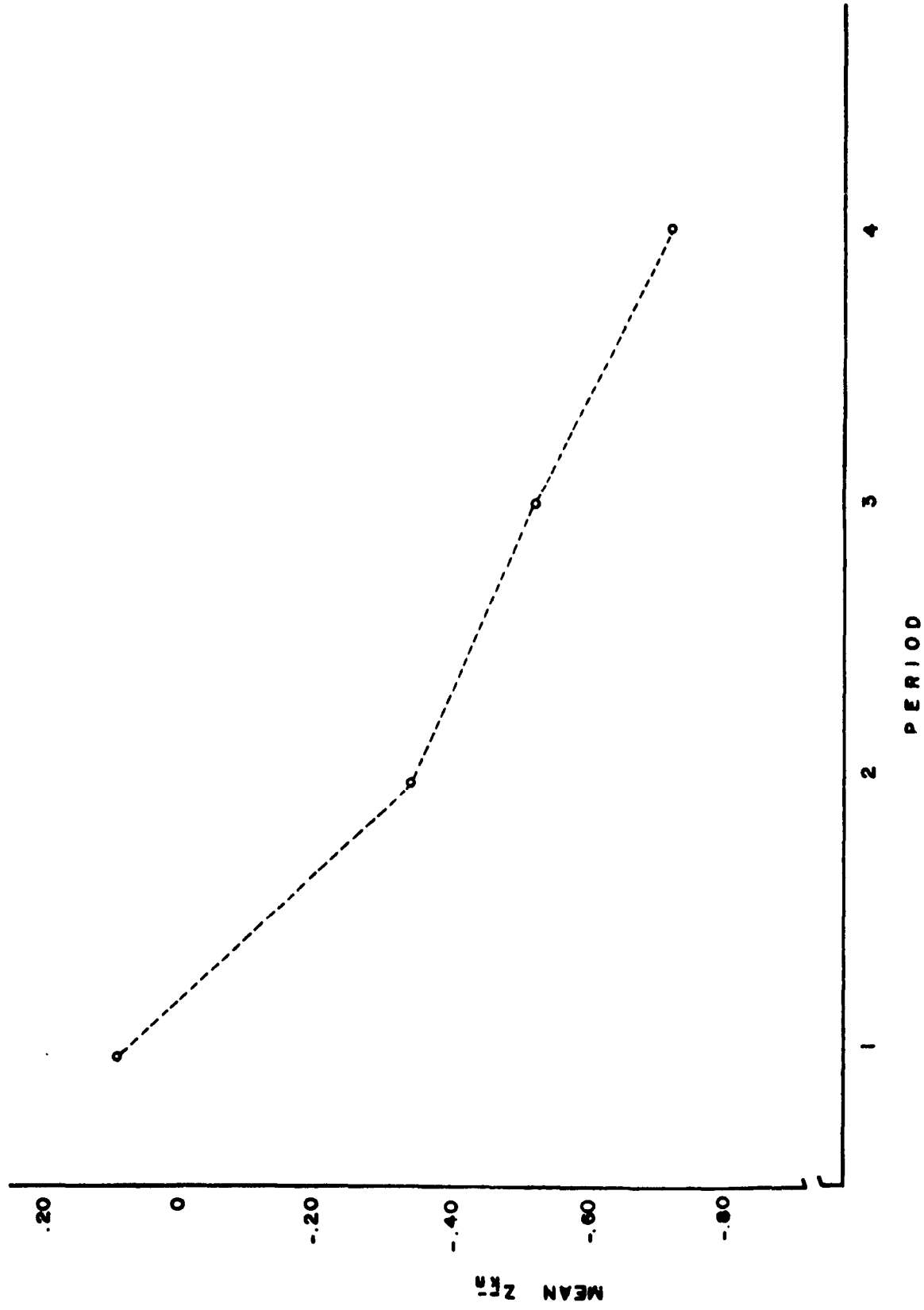


FIG. 4. CORRELATION BETWEEN K AND N (AVERAGE OF FISHER'S Z'S) AS A FUNCTION OF TIME PERIOD.

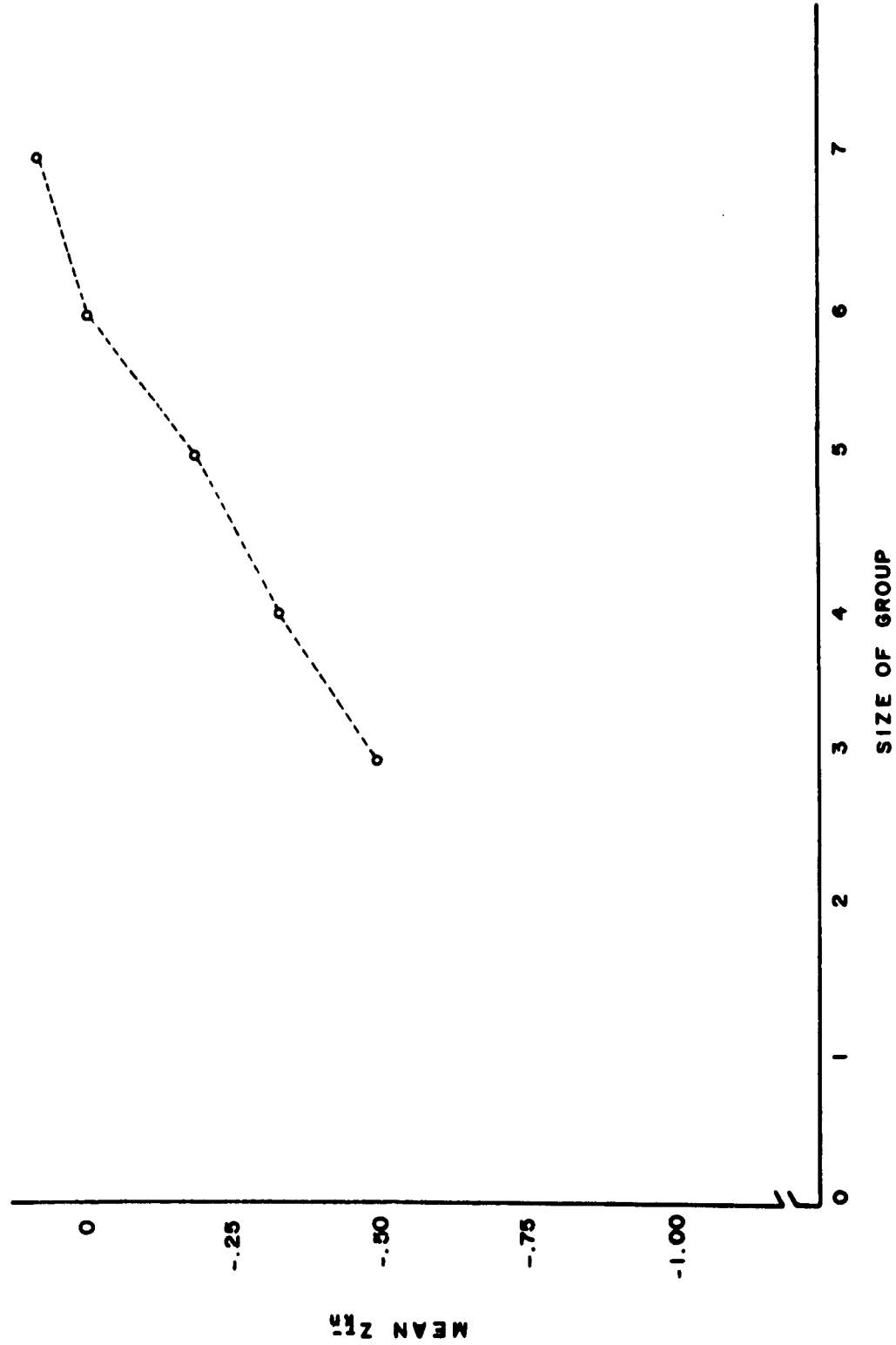


FIG. 5. AVERAGE CORRELATION BETWEEN K AND N (EXPRESSED AS FISHER'S Z) AS A FUNCTION OF SIZE OF GROUP.